

Amendments to Claims

1. (Currently Amended) A method of laser welding aluminum or magnesium members, said method comprising:

positioning said members together in contact between facing surfaces thereof to expose a first outer surface of at least one of said members to laser irradiation;

directing a welding laser beam at said members so as to form a molten weld pool to fuse said members together;

moving said welding laser beam relative to said members; ~~and~~

positioning a heat source supplemental to the welding laser beam at a second outer surface of at least one of said members that is substantially opposite of said first outer surface;
and

heating a zone of said members with the a heating source supplemental to the welding laser beam so as to slow the rate of solidification of said molten weld pool, thereby enabling formation of a substantially porosity-free weld bead joining said members.

2. (Original) A method as claimed in claim 1 wherein said heating step includes widening a temperature distribution in said members around said molten weld pool by at least 25%.

3. (Canceled)

4. (Canceled)

5. (Canceled)

6. (Currently Amended) A method of forming a linear weld between upper and lower members composed of aluminum or magnesium, said method comprising:

positioning said upper and lower members together in contact between facing surfaces thereof to expose a first outer surface of said upper member to laser irradiation;

moving a welding laser beam in a path over said first outer surface, said welding laser beam having an energy and width to progressively melt a trough of molten metal to a depth through said upper member and into said lower member, said molten metal in said trough having a void filled with gas, and said molten metal re-solidifying into re-solidified metal after the passage of said welding laser beam; ~~and~~

positioning a heat source supplemental to the welding laser beam at a second outer surface of at least one of said members that is substantially opposite of said first outer surface;
and

heating in and around said trough with the a heating source supplemental to the welding laser beam to slow the rate of solidification of said molten metal into said re-solidified metal, thereby preventing entrainment of said gas within said re-solidified metal.

7. (Original) A method as claimed in claim 6, wherein said moving step includes the depth of said trough being greater than its width.

8. (Original) A method as claimed in claim 6 wherein said heating step includes widening a temperature distribution in said members around said molten weld trough by at least 25%.

9. (Canceled)

10. (Canceled)

11. (Canceled)

12. (Currently Amended) A method of improving the quality of a laser weld joining an assembly of members, said method comprising:

moving a welding laser beam in a path over said assembly, said welding laser beam having an energy and width to progressively melt a trough of molten metal to a depth through said upper member and into said lower member, said molten metal in said trough having a void

filled with gas, and said molten metal re-solidifying into re-solidified metal after the passage of said welding laser beam; ~~and~~

positioning a heat source supplemental to the welding laser beam on an opposite side of said assembly from said welding laser beam

directing heat from the a heating source supplemental to the welding laser beam toward said trough of molten metal and in accordance with said path so as to widen a heat-affected zone around said trough for slowing the rate of solidification of said molten metal into said re-solidified metal, thereby preventing entrainment of said gas within said re-solidified metal.

13. (Original) A method as claimed in claim 12, wherein the depth of said trough is greater than its width.

14. (Original) A method as claimed in claim 12 wherein said directing step includes widening a temperature distribution in said assembly around said molten weld trough by at least 25%.

15. (Canceled)

16. (Canceled)

17. (Canceled)